



U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: INTERPRETATION OF FAILURE FOR
STATIC STRUCTURAL TEST PROGRAMS

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Initiated by: ACE-1 00

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Change:

1. PURPOSE. This advisory circular (AC) provides information and guidance concerning the interpretation of failure for small airplanes for static structural test programs applicable to Part 23 of the Federal Aviation Regulations (FAR). Accordingly, this material is neither mandatory nor regulatory in nature.

2. RELATED FAR SECTION. Section 23.305(b).

3. BACKGROUND. On past type certification programs, the interpretation of a structural failure of a static test specimen has varied greatly. In the most strict interpretation, if one part or component failed beyond limit load but below ultimate, the test was stopped, the part was repaired, and the test rerun. The repair, in this case, became part of the type design. In a more liberal vein, a local failure up to ultimate load was accepted, as long as the entire structure being tested demonstrated the capability of carrying ultimate load for 3 seconds. In addition, the applicant was not required to redesign or structurally beef up the locally failed part. In a third instance, the specimen was loaded to destruction with a continuously increasing load at a constant rate, and with a continuous recording of the test results. The ultimate load was established as the load attained 3 seconds before the maximum load was recorded.

4. INTERPRETATION OF FAILURE. In the interest of standardization and to eliminate the wide variety of requirements imposed on different applicants by the various Aircraft Certification Offices, the following definition should be used by all Aircraft Certification Offices to assess the acceptability of a failure for small airplanes in a structural static test to ultimate load:

A structural static failure has occurred when the article being tested cannot sustain an increase in load, or cannot sustain the required load for at least 3 seconds. Local failures are allowable if occurrence is beyond limit load and if the article can reach and sustain ultimate load.

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